

Air Quality Technical Report
Badger Hills POD Environmental Assessment

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Bureau of Land Management

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AQ 1 Air Quality Regulations

The basic framework for controlling air pollutants in the United States is mandated by the 1970 Clean Air Act and its amendments, and the 1999 Regional Haze Regulations. The Clean Air Act addresses criteria air pollutants, State and national ambient air quality standards for criteria air pollutants and the Prevention of Significant Deterioration program. The Regional Haze Regulations address visibility impairment.

Pollutants

Air Pollutants addressed in this study include criteria pollutants, hazardous air pollutants (HAP) and sulfur and nitrogen compounds.

Criteria Pollutants

Criteria pollutants are those for which national standards of concentration have been established. Pollutant concentrations greater than these standards represent a risk to human health. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), particulate matter (PM-10, PM-2.5), and lead (Pb).

CO is an odorless, colorless gas formed during any combustion process, such as operation of engines, fireplaces, furnaces, etc. High concentrations of CO affect the oxygen-carrying capacity of the blood and can lead to unconsciousness and asphyxiation. Forest fires are natural sources of CO.

NO₂ is a red-brown gas formed during operation of internal combustion engines. Such engines emit a mixture of nitrogen gases, collectively called nitrogen oxides (NO_x). NO₂ can contribute to brown cloud@ conditions, and can convert to ammonium and nitrate particles and nitric acid which can cause visibility impairment and acid rain. Bacterial action in soil can be a natural source of nitrogen compounds.

O₃ is a faint blue gas that is generally not emitted directly into the atmosphere, but is formed from NO_x and volatile organic compounds (VOC) emissions. As stated above, internal combustion engines are the main source of NO_x. Volatile organic compounds like turpenes are very reactive. Sources of VOC include paint, varnish and some types of vegetation. The faint acrid smell common after thunderstorms is due to ozone formation by lightning. O₃ is a strong oxidizing chemical that can burn lung and eyes, and damage plants.

SO₂ forms during combustion from trace levels of sulphur in coal or diesel fuel, and can convert to ammonium sulfate (SO₄⁻) and sulphuric acid (H₂SO₄) which can cause visibility impairment and acid rain. Volcanoes are natural sources of SO₂.

Particulate matter (i.e., soil particles, hair, pollen, etc.) is essentially the small particles suspended in the air which settle to the ground slowly and may be re-suspended if disturbed. Separate allowable concentration levels for particulate matter are based on the relative size of the particle:

- PM-10, particles with diameters less than 10 micrometers, are small enough to be inhaled and can cause adverse health effects.
- PM-2.5, particles with diameters less than 2.5 micrometers, are so small that they can be drawn deeply into the lungs and cause serious health problems. These particles are also the main cause of visibility impairment.

Before the wide use of unleaded fuel for automobiles, lead particles were emitted from tailpipes.

Lead is not considered in this EIS because no proposed projects are expected to emit lead.

Hazardous Air Pollutants

There are a wide variety of hazardous air pollutants (HAP) including N-hexane, ethylbenzene, toluene, xylene, formaldehyde and benzene. Although HAP do not have federal standards, they do have “significance thresholds” set by various States and are typically evaluated for potential chronic inhalation and cancer risks.

Hazardous air pollutant emissions are associated with industrial activity, including oil and gas operations, refineries, paint facilities, wood working shops and dry cleaners.

Sulfur and Nitrogen Compounds

Sulfur and nitrogen compounds that can be deposited on terrestrial and aquatic ecosystems include nitric acid (HNO_3), nitrate (NO_3^-), ammonium (NH_4^+), and sulfate (SO_4^{2-}).

Nitric acid (HNO_3) and nitrate (NO_3^-) are not emitted directly into the air, but form in the atmosphere from industrial and automotive emissions of nitrogen oxides (NO_x). Sulfate (SO_4^{2-}) is formed in the atmosphere from industrial emission of sulphur dioxide (SO_2). Deposition of HNO_3 , NO_3^- and SO_4^{2-} can adversely effect plant growth, soil chemistry, lichens and petroglyphs.

Ammonium (NH_4^+) is associated with feedlots and agricultural fertilization. Deposition of NH_4^+ can affect vegetation. While deposition may be beneficial as a fertilizer, it can adversely affect the timing of plant growth and dormancy.

Montana and National Ambient Air Quality Standards

Montana Ambient Air Quality Standards (MAAQS) and National Ambient Air Quality Standards (NAAQS) set the absolute upper limits for criteria air pollutant concentrations at all locations to which the public has access. The MAAQS and NAAQS are legally enforceable standards.

Concentrations above the MAAQS and NAAQS represent a risk to human health. State standards must be equally or more strict than federal standards, but cannot be less strict.

The EPA has developed standards for each criteria pollutant for a specific averaging time. Short averaging times (1, 3, and 24 hours) addresses short-term exposure while the annual standards address long-term exposure. Annual standards are set to lower allowable concentrations than are short-term standards to recognize the cumulative effects of long-term exposure.

Table AQ1: National and Montana air quality standards for criteria pollutants

Air Pollutant	Averaging Time	NAAQS		MAAQ	
		$\mu\text{g}/\text{m}^3$	ppm	$\mu\text{g}/\text{m}^3$	ppm
Carbon Monoxide CO	1 hour	40,000	35	26,450	.23
	8 hour	10,000	9	10,000	.9
Nitrogen Dioxide NO ₂	1 hour			564	.3
	Annual	100	.05	94	.05
Sulfur Dioxide SO ₂	1 hour			1300	.5
	3 hour	1300	.5		
	24 hour	365	.14	262	.1
	Annual	80	.03	52	.02
Ozone O ₃	1 hour	235	.12	196	.1
	8 hour	157	.08	157	.08
Particulate Matter PM ₁₀	24 hour	150		150	
	Annual	50		50	
Fine Particulate Matter PM _{2.5}	24 hour	65		65	
	Annual	15		15	

Prevention of Significant Deterioration

The goal of the Prevention of Significant Deterioration (PSD) program is to ensure that air quality in areas with clean air does not significantly deteriorate, while maintaining a margin for future industrial growth. Under PSD, each area in the United States is classified by the air quality in that region:

- PSD Class I Areas: Areas with pristine air quality, such as wilderness areas, national parks and Indian reservations, are accorded the strictest protection. Only very small incremental increases in concentration are allowed in order to maintain the very clean air quality in these areas.
 - Mandatory PSD Class I Areas: large National Parks and Wilderness Areas originally designated Class I in the 1977 Clean Air Act
 - Non-Mandatory PSD Class I Areas: PSD Class II areas for which re-designation to PSD Class I has been chosen
- PSD Class II Areas: Essentially, all areas that are not designated Class I are designated Class II. Moderate incremental increases in concentration are allowed, although the concentrations are not allowed to reach the concentrations set by Montana and federal standards (MAAQS and NAAQS).
- PSD Class III Areas: No areas have yet been designated Class III. Concentrations would be allowed to increase all the way up to the MAAQS and NAAQS.

Table AQ2: PSD Increments

Pollutant	Averaging Time	PSD Increment			
		Class I		Class II	
		($\mu\text{g}/\text{m}^3$)	ppm	($\mu\text{g}/\text{m}^3$)	ppm
Nitrogen Dioxide NO ₂	Annual	2.5	0.0013	25	0.013
Sulfur Dioxide SO ₂	3 hour	25	0.0096	512	0.1956
	24 hour	5	0.0019	91	0.0348
	Annual	2	0.0008	20	0.0076
Particulate Matter PM ₁₀	24 hour	8		30	
	Annual	4		17	

There are several mandatory and non-mandatory PSD Class I areas in the Tongue River – Badger Hill region (see table AQ3). The Tongue River – Badger Hill project area is classified as PSD Class II.

Table AQ3: PSD Class I and Sensitive PSD Class II Areas near the Tongue River – Badger Hill project area.

Area	Agency	Direction from project	Distance from project (km)
Mandatory PSD Class I			
Yellowstone NP	NPS	W	275
North Absaroka WA	USFS	WSW	225
UL Bend WA	USFS	NNW	300
Washakie WA	USFS	WSW	225
Voluntary PSD Class I			
Northern Cheyenne R	Tribal	N	35
Fort Peck R	Tribal	N	350
Sensitive PSD Class II			
Crow R	Tribal	W	15
Big Horn Canyon NRA	NPS	W	100
Cloud Peak	USFS	SSW	75
Absaroka-Beartooth WA	USFS	W	200
Devils Tower NM	NPS	E	165

Regional Haze Regulations

Visibility impairment is an indicator of air pollution concentration. Visibility can be defined as the distance one can perceive color, contrast and detail. Fine particulate matter (PM_{2.5}) is the main cause of visibility impairment. Visual range, one of several ways to express visibility, is the furthest distance a person can distinguish a dark landscape feature from a light background like the sky. Without human-caused visibility impairment, natural visual range would average about 150 miles in the western United States and about 70 miles in the eastern United States.

The Regional Haze Regulations were developed by the EPA in response to the Clean Air Act Amendments of 1990. They are intended to maintain and improve visibility in PSD Class I areas across the United States, so that visibility in these areas is returned to natural conditions. These regulations require States to demonstrate reasonable progress in maintaining or improving visibility in PSD Class I areas.

AQ2 Climate and Meteorology

The climate of the Tongue River – Badger Hills area is classified as mid-latitude semi-arid steppe (Trewartha & Horn, 1980). Steppe climate is characterized by large seasonal variations in temperature (cold winters and warm summers) and by precipitation levels that are low but still sufficient for grasses.

Weather data for the Tongue River – Badger Hills area are available from the State ambient monitoring station located in Colstrip, Montana.

Temperature

Mean monthly temperatures range from 9° F in January to 87° F in August.

Precipitation

Mean monthly precipitation ranges from 2.7 inches of rain in June to .5 inches of precipitable water in snowfall in December and February, for mean annual precipitation of 14.7 inches.

Mean monthly snowfall ranges from .3 inches in June to 6.8 inches in January, with no snowfall in July or August. Mean annual snowfall is about 3 feet.

AQ 3: Air Quality

Concentrations

Background Air Quality

Table 3.4 presents background concentrations for the four criteria pollutants addressed in this analysis. These concentrations are intended to represent air quality conditions in south-central Montana. The table below shows background concentration in terms of concentration and as the percentage of applicable federal and Montana air quality standards. See also Figure 3.2.3-1 in the Air Quality Appendix of the Badger Hills POD environmental assessment.

Table 3.4: Background concentrations of criteria air pollutants

Pollutant	Averaging Time	Monitored Concentration ($\mu\text{g}/\text{m}^3$)	Percent NAAQS	Percent MAAQS
Carbon Monoxide CO	8 hour	1150	11.5	11.5
	1 hour	1725	4.3	6.5
Nitrogen Dioxide NO ₂	Annual	6	6.0	6.3
	1 hour	75		13.3
Sulfur Dioxide SO ₂	Annual	3	3.8	5.8
	24 hour	11	3	4.2
	3 hour	26	2	
	1 hour	35		2.7
Particulate Matter PM ₁₀	Annual	8	16	16
	24 hour	30	20	20

SLAMS MONITORING DATA

* US EPA - AirData Monitor Values Report
 * Monday, 5-Jan-2004 at 4:41:1 PM (USA Eastern time zone)
 * Geographic Area: Montana
 * Year: 2003, 2002, 2001, 2000, 1999, 1998, 1997, 1996, 1995, 1994, 1993
 * Air Quality Monitors
 * File Size : 48 Rows
 * File Format: TSV - Tab Separated Values
 * Field 1: # Obs (1-hour NO2)
 * Field 2: 1st Max (1-hour NO2)
 * Field 3: 2nd Max(1-hour NO2)
 * Field 4: Mean (Annual NO2)
 * Field 5: # Exceed (Annual NO2)
 * Field 6: Monitor Number (NO2)
 * Field 7: Monitor Type (NO2)
 * Field 8: Dominant Source Type(NO2)
 * Field 9: Year
 * Field 10: Site ID
 * Field 11: Site Address
 * Field 12: City
 * Field 13: County

1 hour NO2				annual NO2		monitor	monitor type	source type	year	ID	Address	County
# Obs	1st max	2nd max	mean	# exceedences								
4047	0.048	0.039	0.012	0	Industrial	Point	2001	300630036	Ducharme And Main Street		Missoula Co	
8195	0.051	0.048	0.012	0	Industrial	Point	2002	300630036	Ducharme And Main Street		Missoula Co	
2018	0.052	0.044	0.015	0	Industrial	Point	2003	300630036	Ducharme And Main Street		Missoula Co	
6140	0.01	0.008	0.003	0	Industrial		2002	300650004	0.5 Mile E. Of Hwy 87 & 0.25 N. Of Old D		Musselshell Co	
7836	0.05	0.045	0.005	0	Industrial		1993	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
7690	0.039	0.039	0.005	0	Industrial		1994	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
5523	0.033	0.033	0.006	0	Industrial		1995	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
4355	0.037	0.037	0.006	0	Industrial		1996	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
6290	0.046	0.039	0.006	0	Industrial		1997	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
2864	0.035	0.032	0.006	0	Industrial		1998	300870700	Mpc #3, Cedar Ave Hill, Colstrip		Rosebud Co	
7584	0.038	0.036	0.005	0	Industrial		1993	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
7793	0.038	0.036	0.005	0	Industrial		1994	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
8361	0.04	0.037	0.005	0	Industrial		1995	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
7490	0.045	0.035	0.004	0	Industrial		1996	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
7887	0.036	0.033	0.004	0	Industrial		1997	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
1570	0.03	0.029	0.006	0	Industrial		1998	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
7404	0.04	0.04	0.004	0	Industrial		1999	300870701	Mpc #1,Hiway 39 Industrial Park,Colstrip		Rosebud Co	
7857	0.023	0.022	0.003	0	Industrial		1993	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
8077	0.028	0.023	0.003	0	Industrial		1994	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
7476	0.042	0.038	0.003	0	Industrial		1995	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
8345	0.033	0.033	0.003	0	Industrial		1996	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
8313	0.036	0.033	0.003	0	Industrial		1997	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
4417	0.021	0.02	0.003	0	Industrial		1998	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
2059	0.032	0.032	0.003	0	Industrial		1999	300870702	Mpc #2, 5&6 Pond West, Colstrip		Rosebud Co	
3750	0.042	0.037	0.003	0	Tribal Monitors	Point	1993	300870760	No Cheyenne, Morningstar		Rosebud Co	

1 hour NO2				annual NO2				monitor							
# Obs	1st max	2nd max	mean	# exceedences	monitor type	source type	year	ID	Address						
7559	0.025	0.024	0.003	0	0 Tribal Monitors	Point	1995	300870760	No Cheyenne, Morningstar	Rosebud Co					
4235	0.035	0.029	0.003	0	0 Tribal Monitors	Point	1996	300870760	No Cheyenne, Morningstar	Rosebud Co					
7773	0.056	0.025	0.003	0	0 Tribal Monitors	Point	1997	300870760	No Cheyenne, Morningstar	Rosebud Co					
6983	0.044	0.04	0.003	0	0 Tribal Monitors	Point	1998	300870760	No Cheyenne, Morningstar	Rosebud Co					
7865	0.032	0.029	0.003	0	0 Tribal Monitors	Point	1999	300870760	No Cheyenne, Morningstar	Rosebud Co					
8190	0.034	0.031	0.003	0	0 Tribal Monitors	Point	2000	300870760	No Cheyenne, Morningstar	Rosebud Co					
2058	0.034	0.023	0.003	0	0 Tribal Monitors	Point	1993	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
8640	0.04	0.039	0.003	0	0 Tribal Monitors	Point	1994	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
8226	0.066	0.057	0.003	0	0 Tribal Monitors	Point	1995	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
4229	0.039	0.029	0.003	0	0 Tribal Monitors	Point	1996	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
7205	0.067	0.048	0.003	0	0 Tribal Monitors	Point	1997	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
7402	0.15	0.03	0.003	0	0 Tribal Monitors	Point	1998	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
7744	0.047	0.04	0.003	0	0 Tribal Monitors	Point	1999	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
8574	0.035	0.027	0.003	0	0 Tribal Monitors	Point	2000	300870761	No Cheyenne, Garfield Peak	Rosebud Co					
2020	0.034	0.022	0.003	0	0 Tribal Monitors	Point	1993	300870762	No Cheyenne, Badger Peak	Rosebud Co					
8309	0.032	0.026	0.003	0	0 Tribal Monitors		1994	300870762	No Cheyenne, Badger Peak	Rosebud Co					
7613	0.031	0.029	0.003	0	0 Tribal Monitors		1995	300870762	No Cheyenne, Badger Peak	Rosebud Co					
4056	0.03	0.024	0.003	0	0 Tribal Monitors		1996	300870762	No Cheyenne, Badger Peak	Rosebud Co					
7155	0.021	0.018	0.003	0	0 Tribal Monitors		1997	300870762	No Cheyenne, Badger Peak	Rosebud Co					
6738	0.019	0.018	0.003	0	0 Tribal Monitors		1998	300870762	No Cheyenne, Badger Peak	Rosebud Co					
7744	0.047	0.04	0.003	0	0 Tribal Monitors		1999	300870762	No Cheyenne, Badger Peak	Rosebud Co					
8253	0.026	0.024	0.003	0	0 Tribal Monitors		2000	300870762	No Cheyenne, Badger Peak	Rosebud Co					
2071	0.023	0.02	0.003	0	0 Tribal Monitors					Rosebud Co					

Figure 3.2.3-2

NO2 1 hour 2nd max

	Badger	Pea	Garfield	Pea	Morningstar
1993	0.026	0.039		0.037	
1994	0.029	0.057		0.024	
1995	0.024	0.029		0.029	
1996	0.018	0.048		0.025	
1997	0.018	0.03		0.04	
1998	0.04	0.04		0.029	
1999	0.024	0.027		0.031	
2000	0.02	0.022		0.023	

Figure 3.2.3-3

NO2 Annual

	Badger	Peak	Garfield	Peak	Morningstar
1993			0.003	0.003	0.003
1994			0.003	0.003	0.003
1995			0.003	0.003	0.003
1996			0.003	0.003	0.003
1997			0.003	0.003	0.003
1998			0.003	0.003	0.003
1999			0.003	0.003	0.003
2000			0.003	0.003	0.003

Figure 3.2.3-4

NO2 PSD Class I increment and significance level

	NO2 annual (ug/m3)
Yellowstone National Park	0.0005
UL Bend Wilderness	0.009
North Absaroka Wilderness	0.0009
Northern Cheyenne Reservation	1.248

1 hour SO2				3 hour SO2				24 hour SO2				annual SO2				Monitor				Source	Objective	Year	IS	Address	City	County
# Obs	1st Max	2nd Max		1st Max	2nd Max	# Exceed		1st Max	2nd Max	# Exceed		mean	# Exceed	#	Type	Scale										
7773	0.02	0.016	0.01	0.007	0	0.003	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1993	300870760	No Cheyenne, Morning	Rosebud Co								
8648	0.057	0.033	0.036	0.012	0	0.006	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1994	300870760	No Cheyenne, Morning	Rosebud Co								
4238	0.024	0.02	0.01	0.008	0	0.003	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1995	300870760	No Cheyenne, Morning	Rosebud Co								
7695	0.04	0.012	0.014	0.006	0	0.003	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1996	300870760	No Cheyenne, Morning	Rosebud Co								
6985	0.025	0.025	0.01	0.009	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1997	300870760	No Cheyenne, Morning	Rosebud Co								
7866	0.024	0.019	0.015	0.013	0	0.006	0.004	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1998	300870760	No Cheyenne, Morning	Rosebud Co								
7648	0.033	0.019	0.017	0.009	0	0.004	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1999	300870760	No Cheyenne, Morning	Rosebud Co								
2058	0.013	0.013	0.006	0.006	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	2000	300870760	No Cheyenne, Morning	Rosebud Co								
8038	0.022	0.013	0.009	0.008	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1993	300870761	No Cheyenne, Garfield	Rosebud Co								
8651	0.041	0.021	0.027	0.008	0	0.005	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1994	300870761	No Cheyenne, Garfield	Rosebud Co								
4241	0.013	0.013	0.009	0.005	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1995	300870761	No Cheyenne, Garfield	Rosebud Co								
8255	0.018	0.016	0.008	0.007	0	0.003	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1996	300870761	No Cheyenne, Garfield	Rosebud Co								
8516	0.05	0.024	0.021	0.011	0	0.004	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1997	300870761	No Cheyenne, Garfield	Rosebud Co								
8244	0.095	0.03	0.046	0.011	0	0.007	0.004	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1998	300870761	No Cheyenne, Garfield	Rosebud Co								
8067	0.017	0.013	0.011	0.008	0	0.005	0.003	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	1999	300870761	No Cheyenne, Garfield	Rosebud Co								
2149	0.013	0.011	0.007	0.007	0	0.003	0.002	0	0.001	0	0	1 Tribal Monitors	Point	Source Oriented	2000	300870761	No Cheyenne, Garfield	Rosebud Co								
8635	0.012	0.011	0.006	0.005	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1993	300870762	No Cheyenne, Badger	Rosebud Co								
8431	0.045	0.022	0.015	0.008	0	0.004	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1994	300870762	No Cheyenne, Badger	Rosebud Co								
4237	0.01	0.009	0.005	0.005	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1995	300870762	No Cheyenne, Badger	Rosebud Co								
7182	0.01	0.009	0.006	0.005	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1996	300870762	No Cheyenne, Badger	Rosebud Co								
6710	0.17	0.04	0.057	0.014	0	0.011	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1997	300870762	No Cheyenne, Badger	Rosebud Co								
8244	0.095	0.03	0.046	0.011	0	0.007	0.004	0	0.001	0	0	1 Tribal Monitors	Unknown		1998	300870762	No Cheyenne, Badger	Rosebud Co								
8255	0.01	0.008	0.005	0.005	0	0.002	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		1999	300870762	No Cheyenne, Badger	Rosebud Co								
2071	0.019	0.014	0.011	0.009	0	0.003	0.002	0	0.001	0	0	1 Tribal Monitors	Unknown		2000	300870762	No Cheyenne, Badger	Rosebud Co								

Figure 3.2.3-5
1 hour

	Badger	Pea	Garfield	Pe	Morningstar	
1993	0.011	0.022	0.007	0.005	0.008	0.007
1994	0.022	0.041	0.012	0.008	0.008	0.012
1995	0.009	0.013	0.008	0.005	0.005	0.008
1996	0.009	0.018	0.006	0.005	0.007	0.006
1997	0.04	0.05	0.009	0.014	0.011	0.009
1998	0.03	0.095	0.013	0.011	0.011	0.013
1999	0.008	0.017	0.009	0.005	0.008	0.009
2000	0.014	0.011	0.006	0.009	0.007	0.006

Figure 3.2.3-6
3 hour

	Badger	Pea	Garfield	Pe	Morningstar

Figure 3.2.3-7
24 hour

	Badger	Pea	Garfield	Pe	Morningstar

Figure 3.2.3-8
annual

	Badger	Pea	Garfield	Pe	Morningstar

Figures 3.2.3-9, 3.2.3-10 and 3.2.3-11
SO2 PSD Class I increment and significance level

	annual	24 hour	3 hour
Yellowstone National Park	0.013	0.55	1.8
UL Bend Wilderness	0.037	0.78	3.08
North Absaroka Wilderness	0.015	0.58	1.77
Northern Cheyenne Reservation	0.5	6.64	38.18

	PM10 99th percerntile 24 hour				PM10 annual mean			
	1a	1b	1c	2	1a	1b	1c	2
1993	94			46		26		14
1994	130			41		34		15
1995	99			47		25		13
1996	89			30		20		12
1997	106	75		27		18	25	12
1998	57	144	120			23	32	32
1999	43	98	98			19	33	31
2000	55	122				18	28	
2001	46	103				20	35	
2002	85	112				18	28	
2003	41	170				14	29	

VISIBILITY

IMPROVE MONITORING DATA

- ASITE= YELL TP SITE=GRTE GROUP =10 --													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
	20% cleanest	20% cleanest	20% cleanest										
1992	226	140.459913	5.6	7.6	2.63	34.6	0.58	7.7	2.31	30.3	0.81	10.6	1.27 16.7
1993	237	147.2964574	5.1	6.65	2.08	31.2	0.46	6.99	2.23	33.5	0.59	8.89	1.29 19.4
1994	245	152.2684897	4.7	6.1	2.36	38.7	0.57	9.4	1.58	25.9	0.56	9.11	1.03 16.8
1995	245	152.2684897	4.7	6.01	1.91	31.8	0.41	6.77	1.41	23.4	0.57	9.44	1.72 28.6
1996	237	147.2964574	5.1	6.65	2.45	36.8	0.53	7.95	1.75	26.3	0.45	6.72	1.48 22.2
1997	265	164.6985705	3.9	4.82	1.79	37.2	0.32	6.59	1.89	39.1	0.41	8.46	0.42 8.65
1999	271	168.4275948	3.7	4.58	1.81	39.6	0.54	11.9	1.21	26.4	0.48	10.5	0.53 11.5
2000	267	165.9415786	3.8	4.68	2.02	43.1	0.95	20.3	1.14	24.3	0.2	4.37	0.37 7.98
2001	265	164.6985705	3.9	4.88	2.16	44.3	0.85	17.4	1.12	23	0.39	7.96	0.36 7.3
- ASITE= YELL TP SITE=GRTE GROUP =30 --													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
1992	174		8.1	12.49	3.7	29.6	0.81	6.53	3.64	29.1	1.24	9.96	3.09 24.8
1993	192		7.1	10.46	3.82	36.5	0.93	8.85	3.02	28.8	0.97	9.31	1.72 16.5
1994	200		6.7	9.58	3.16	33	1.42	14.8	2.27	23.7	0.64	6.63	2.09 21.8
1995	211		6.2	8.57	2.72	31.8	0.84	9.78	2.31	26.9	0.66	7.64	2.05 23.9
1996	195		7	10.09	2.89	28.6	1.11	11	2.96	29.3	0.76	7.51	2.38 23.6
1997	223		5.6	7.57	2.99	39.4	0.87	11.5	2.36	31.2	0.47	6.16	0.88 11.7
1999	213		6.1	8.42	2.64	31.4	0.79	9.38	3.12	37	0.74	8.83	1.13 13.4
2000	220		5.7	7.77	3.01	38.7	1.01	13	2.23	28.8	0.72	9.33	0.79 10.1
2001	213		6.1	8.41	3.16	37.6	1.02	12.2	2.42	28.8	0.76	9.01	1.04 12.4
- ASITE= YELL TP SITE=GRTE GROUP =50 --													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
	average	average	average										
1992	155	96.33312617	9.3	15.3	5.13	33.5	1.49	9.76	4.51	29.5	1.39	9.1	2.77 18.1
1993	166	103.1696706	8.6	13.52	4.03	29.8	0.96	7.11	4.55	33.7	1.13	8.32	2.86 21.1
1994	170	105.6556868	8.3	13.05	4.69	35.9	1.74	13.3	3.42	26.2	1.27	9.76	1.93 14.8
1995	183	113.7352393	7.6	11.46	3.44	30	0.76	6.63	3.47	30.3	1.48	13	2.3 20.1
1996	162	100.6836544	8.9	14.35	4.12	28.7	1.55	10.8	4.33	30.2	1.03	7.18	3.32 23.2
1997	201	124.922312	6.7	9.51	2.79	29.3	0.67	7.04	3.59	37.7	0.68	7.12	1.78 18.8
1999	185	114.9782474	7.5	11.11	3.6	32.4	0.9	8.07	4.23	38.1	1.14	10.3	1.24 11.2
2000	193	119.9502797	7.1	10.26	3.49	34	1.75	17.1	3.09	30.2	0.86	8.38	1.06 10.3
2001	189	117.4642635	7.3	10.71	4.23	39.5	1.21	11.3	3.06	28.5	0.85	7.94	1.36 12.7

- ASITE= YELL TP SITE=GRTE GROUP =70 --													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
1992	134		10.7	19.21	3.52	18.3	0.85	4.45	6.65	34.6	2.93	15.3	5.25 27.3
1993	148		9.7	16.36	4.29	26.2	1.04	6.34	5.87	35.9	1.81	11.1	3.35 20.5
1994	141		10.3	17.92	4.42	24.7	1.04	5.78	6.38	35.6	1.74	9.7	4.34 24.2
□				ANNUAL TREND	S - RECO N		EXTIN CTION			1 1:50 Wed	nesday,	April	30, 2003 970
- ASITE= YELL TP SITE=GRTE GROUP =70 --													
(continued)													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
1995	151		9.5	16.01	3.96	24.7	1.05	6.58	4.82	30.1	1.84	11.5	4.34 27.1
1996	134		10.7	19.22	4.38	22.8	0.95	4.93	6.61	34.4	1.67	8.69	5.61 29.2
1997	177		7.9	12.15	4.86	40	0.52	4.29	4.16	34.3	0.73	6.03	1.87 15.4
1999	162		8.8	14.22	4.47	31.4	1.14	8.02	4.95	34.8	1.15	8.09	2.52 17.7
2000	162		8.8	14.13	4.13	29.3	1.7	12.1	5.03	35.6	1.22	8.65	2.04 14.5
2001	164		8.7	13.97	5.49	39.3	2.21	15.8	3.34	23.9	1.13	8.1	1.8 12.9
- ASITE= YELL TP SITE=GRTE GROUP =90 --													
YEAR	SVR	DV	RBEXT	ESO4	F_ESO4	ENO3	F_ENO3	EOMC	F_EOMC	ELAC	F_ELAC	ECM	F_ECM
20% hazies		20% haziest	20% haziest										
1992	109	67.74394034	13.1	28.66	7.15	24.9	3.32	11.6	8.59	30	3.01	10.5	6.6 23
1993	120	74.58048477	11.9	23.34	5.03	21.5	2.34	10	7.63	32.7	2.47	10.6	5.87 25.1
1994	96	59.66438782	14.4	33.91	4.53	13.3	1.71	5.05	15.83	46.7	3.31	9.76	8.53 25.1
1995	122	75.82349285	11.7	22.33	4.42	19.8	1.93	8.65	6.83	30.6	2.74	12.3	6.42 28.7
1996	95	59.04288378	14.5	34.27	4.92	14.3	1.52	4.43	17.05	49.8	4.19	12.2	6.6 19.3
1997	143	88.87507769	10.2	17.97	5.66	31.5	1.6	8.89	6.52	36.3	1.52	8.45	2.67 14.9
1999	126	78.30950901	11.5	22.52	3.75	16.7	1.14	5.07	9.1	40.4	1.9	8.43	6.63 29.4
2000	116	72.09446861	12.6	27.53	4.72	17.2	2.64	9.58	13.12	47.7	3.57	13	3.48 12.6
2001	114	70.85146053	12.6	26.57	5.28	19.9	2.51	9.45	12.04	45.3	2.65	9.97	4.09 15.4

ATMOSPHERIC DEPOSITION

NADP MONITORING DATA

CASTNET MONITORING DATA

NATION AL ATMOIC DEPOS PROGRA M/NTN

Site I Site ID	D: MT00 D:Range: 1980 2004 Summary Year	Report Crit1 Crit 2	Date: 1/9/ 2004 3:5 Crit3 Crit4	2:19 PM "Ca" "Mg" "K"	"Na" "NH4" "NO3"	Valid Samp Valid SampDays SampDays	Dates								
"MT00"	"Annual"	1984	46	47	97	90	0.16	0.052	0.035	0.113	0.08	0.57	14	0	173 "07/13/1984" "01/02/1985"
"MT00"	"Annual"	1985	96	100	80	97	0.21	0.04	0.027	0.064	0.16	0.67	35	0	363 "01/02/1985" "12/31/1985"
"MT00"	"Annual"	1986	89	100	89	97	0.17	0.024	0.021	0.062	0.12	0.64	38	0	364 "12/31/1986" "12/30/1986"
"MT00"	"Annual"	1987	96	100	99	98	0.19	0.031	0.029	0.083	0.15	0.71	36	11	364 "12/30/1987" "12/29/1987"
"MT00"	"Annual"	1988	90	100	95	95	0.28	0.036	0.023	0.156	0.1	0.57	34	8	371 "12/29/1988" "01/03/1989"
"MT00"	"Annual"	1989	92	100	97	88	0.19	0.028	0.021	0.075	0.19	0.73	42	15	364 "01/03/1989" "01/02/1990"
"MT00"	"Annual"	1990	90	100	82	87	0.23	0.035	0.031	0.067	0.24	0.81	35	23	365 "01/02/1990" "01/02/1991"
"MT00"	"Annual"	1991	98	100	100	94	0.16	0.029	0.025	0.048	0.14	0.71	35	16	363 "01/02/1991" "12/31/1991"
"MT00"	"Annual"	1992	94	100	88	103	0.18	0.022	0.021	0.057	0.19	0.67	35	10	364 "12/31/1992" "12/29/1992"
"MT00"	"Annual"	1993	89	100	98	109	0.16	0.024	0.024	0.058	0.19	0.68	36	26	371 "12/29/1993" "01/04/1994"
"MT00"	"Annual"	1994	94	100	99	107	0.16	0.02	0.022	0.054	0.22	0.73	36	23	364 "01/04/1994" "01/03/1995"
"MT00"	"Annual"	1995	89	100	97	101	0.13	0.016	0.025	0.065	0.2	0.63	41	31	364 "01/03/1995" "01/02/1996"
"MT00"	"Annual"	1996	93	100	92	91	0.17	0.024	0.041	0.074	0.2	0.84	34	22	364 "01/02/1996" "12/31/1996"
"MT00"	"Annual"	1997	85	100	94	74	0.21	0.026	0.046	0.081	0.23	0.92	33	27	364 "12/31/1997" "12/30/1997"
"MT00"	"Annual"	1998	83	100	95	103	0.15	0.022	0.023	0.023	0.24	0.92	32	21	364 "12/30/1998" "12/29/1998"
"MT00"	"Annual"	1999	98	100	100	99	0.14	0.018	0.019	0.022	0.24	0.79	38	29	364 "12/29/1999" "12/28/1999"
"MT00"	"Annual"	2000	92	100	95	96	0.22	0.025	0.019	0.038	0.26	0.8	38	26	371 "12/28/2000" "01/02/2001"
"MT00"	"Annual"	2001	100	100	100	96	0.19	0.025	0.02	0.038	0.31	0.84	28	22	365 "01/02/2001" "01/02/2002"
"MT00"	"Annual"	2002	88	100	91	97	0.22	0.027	0.023	0.03	0.38	0.99	33	22	362 "01/02/2002" "12/30/2002"

Site ID	Summary Year	"Cl" SO4	"SO4" SO4	"pH"	"Cond." Field pH	Field pH	Field Cond Ratio c/a	Svol ml	Precip cm Chem	% Ppt F	Valid Samp Valid SampDays SampDays	Dates			
"MT00"	"Annual"	1984	0.21	0.72	5.33	5.57	-9	0.91	5445.3	8.73	0	14	0	173 "07/13/1984" "01/02/1985"	
"MT00"	"Annual"	1985	0.1	0.76	5.29	6.45	-9	1.07	16980.8	32.31	0	35	0	363 "01/02/1985" "12/31/1985"	
"MT00"	"Annual"	1986	0.07	0.73	5.17	6.82	-9	0.99	22501.9	37.8	0	38	0	364 "12/31/1986" "12/30/1986"	
"MT00"	"Annual"	1987	0.1	0.75	5.19	6.89	4.65	10.8	1.05	21568.7	32.9	29	36	11	364 "12/30/1987" "12/29/1987"
"MT00"	"Annual"	1988	0.08	0.79	5.57	6.37	5.15	9.5	1.16	15750.2	25.48	22	34	8	371 "12/29/1988" "01/03/1989"
"MT00"	"Annual"	1989	0.1	0.7	5.45	6.47	5.15	7.2	1.01	20491.1	34.48	42	42	15	364 "01/03/1989" "01/02/1990"
"MT00"	"Annual"	1990	0.11	0.79	5.36	7.12	5.14	7.7	1.1	13366.6	27.51	72	35	23	365 "01/02/1990" "01/02/1991"
"MT00"	"Annual"	1991	0.07	0.61	5.31	6.11	5.18	7.3	0.99	21944.1	34.17	56	35	16	363 "01/02/1991" "12/31/1991"
"MT00"	"Annual"	1992	0.07	0.7	5.43	6.13	5.12	8.3	1.03	21020.9	34.29	37	35	10	364 "12/31/1992" "12/29/1992"
"MT00"	"Annual"	1993	0.06	0.67	5.38	5.92	5.06	6.4	1.04	24932.8	34.52	96	36	26	371 "12/29/1993" "01/04/1994"
"MT00"	"Annual"	1994	0.08	0.66	5.13	7.43	5.11	7.1	1.16	20713.6	28.93	82	36	23	364 "01/04/1994" "01/03/1995"
"MT00"	"Annual"	1995	0.07	0.54	5.16	6.09	5.08	7.6	1.26	22507.2	33.89	89	41	31	364 "01/03/1995" "01/02/1996"
"MT00"	"Annual"	1996	0.11	0.6	5.15	7.26	5.1	7.1	1.14	16956.6	29.52	71	34	22	364 "01/02/1996" "12/31/1996"
"MT00"	"Annual"	1997	0.11	0.64	5.13	7.66	5.08	7.5	1.2	14935.7	31.23	79	33	27	364 "12/31/1997" "12/30/1997"
"MT00"	"Annual"	1998	0.05	0.62	5.05	7.71	4.92	8.1	1.13	22630.3	34.41	59	32	21	364 "12/30/1998" "12/29/1998"
"MT00"	"Annual"	1999	0.04	0.51	5.28	6.17	4.86	7.4	1.16	19484.7	29.11	91	38	29	364 "12/29/1999" "12/28/1999"
"MT00"	"Annual"	2000	0.05	0.55	5.45	6.35	5.01	7.1	1.27	17100.5	27.61	56	38	26	371 "12/28/2000" "01/02/2001"
"MT00"	"Annual"	2001	0.05	0.64	5.42	6.5	5.16	7.4	1.22	12718.5	19.6	97	28	22	365 "01/02/2001" "01/02/2002"
"MT00"	"Annual"	2002	0.04	0.59	5.51	6.87	5.24	7.1	1.34	15052.7	25.06	78	33	22	362 "01/02/2002" "12/30/2002"

NATION	AL ATMOSIC DEPOS PROGRA	M/NTN												
Site I	D: MT00	D Range: 1980	2004	Report	Date: 1/9/	2004	4:3	12:11 PM						
Site ID	Summary P Period	Year	Crit1	Crit2	Crit3	Crit4	"Ca"	"Mg"	"K"	"Na"	"NH4"	"NO3"	Days	Dates
"MT00"	"Annual"	1984	46	47	97	90	0.14	0.045	0.031	0.099	0.07	0.5	173	"07/13/1984" "01/02/1985"
"MT00"	"Annual"	1985	96	100	80	97	0.69	0.129	0.087	0.207	0.51	2.16	363	"01/02/1985" "12/31/1985"
"MT00"	"Annual"	1986	89	100	89	97	0.65	0.091	0.079	0.234	0.43	2.43	364	"12/31/1985" "12/30/1986"
"MT00"	"Annual"	1987	96	100	99	98	0.62	0.102	0.095	0.273	0.51	2.32	364	"12/30/1986" "12/29/1987"
"MT00"	"Annual"	1988	90	100	95	95	0.7	0.092	0.059	0.397	0.26	1.46	371	"12/29/1987" "01/03/1989"
"MT00"	"Annual"	1989	92	100	97	88	0.65	0.097	0.072	0.259	0.64	2.52	364	"01/03/1989" "01/02/1990"
"MT00"	"Annual"	1990	90	100	82	87	0.64	0.096	0.085	0.184	0.66	2.24	365	"01/02/1990" "01/02/1991"
"MT00"	"Annual"	1991	98	100	100	94	0.56	0.099	0.085	0.164	0.47	2.42	363	"01/02/1991" "12/31/1991"
"MT00"	"Annual"	1992	94	100	88	103	0.61	0.075	0.072	0.195	0.66	2.29	364	"12/31/1991" "12/29/1992"
"MT00"	"Annual"	1993	89	100	98	109	0.55	0.083	0.083	0.2	0.64	2.34	371	"12/29/1992" "01/04/1994"
"MT00"	"Annual"	1994	94	100	99	107	0.45	0.058	0.064	0.156	0.64	2.11	364	"01/04/1994" "01/03/1995"
"MT00"	"Annual"	1995	89	100	97	101	0.44	0.054	0.085	0.22	0.69	2.14	364	"01/03/1995" "01/02/1996"
"MT00"	"Annual"	1996	93	100	92	91	0.51	0.071	0.121	0.218	0.6	2.49	364	"01/02/1996" "12/31/1996"
"MT00"	"Annual"	1997	85	100	94	74	0.65	0.081	0.144	0.253	0.71	2.88	364	"12/31/1996" "12/30/1997"
"MT00"	"Annual"	1998	83	100	95	103	0.52	0.076	0.079	0.079	0.81	3.16	364	"12/30/1997" "12/29/1998"
"MT00"	"Annual"	1999	98	100	100	99	0.41	0.052	0.055	0.064	0.69	2.3	364	"12/29/1998" "12/28/1999"
"MT00"	"Annual"	2000	92	100	95	96	0.6	0.069	0.052	0.105	0.7	2.2	371	"12/28/1999" "01/02/2001"
"MT00"	"Annual"	2001	100	100	100	96	0.37	0.049	0.039	0.074	0.61	1.65	365	"01/02/2001" "01/02/2002"
"MT00"	"Annual"	2002	88	100	91	97	0.55	0.068	0.058	0.075	0.96	2.48	362	"01/02/2002" "12/30/2002"

Site ID	Summary P Period	Year	Inorg N	N	Cl	SO4	H+	Lab	H+ Field	Svol	Ppt	% Ppt Rep	F Chem	Days	Dates
"MT00"	"Annual"	1984	0.17	0.18	0.63	0	-9	5445.3	8.73	0	14	0	173	"07/13/1984" "01/02/1985"	
"MT00"	"Annual"	1985	0.88	0.31	2.46	0.02	-9	16980.8	32.31	0	35	0	363	"01/02/1985" "12/31/1985"	
"MT00"	"Annual"	1986	0.89	0.26	2.74	0.03	-9	22501.9	37.8	0	38	0	364	"12/31/1985" "12/30/1986"	
"MT00"	"Annual"	1987	0.92	0.33	2.48	0.02	0.07	21568.7	32.9	29	36	11	364	"12/30/1986" "12/29/1987"	
"MT00"	"Annual"	1988	0.53	0.2	2.01	0.01	0.02	15750.2	25.48	22	34	8	371	"12/29/1987" "01/03/1989"	
"MT00"	"Annual"	1989	1.07	0.33	2.42	0.01	0.02	20491.1	34.48	42	42	15	364	"01/03/1989" "01/02/1990"	
"MT00"	"Annual"	1990	1.02	0.3	2.17	0.01	0.02	13366.6	27.51	72	35	23	365	"01/02/1990" "01/02/1991"	
"MT00"	"Annual"	1991	0.92	0.25	2.09	0.02	0.02	21944.1	34.17	56	35	16	363	"01/02/1991" "12/31/1991"	
"MT00"	"Annual"	1992	1.03	0.23	2.4	0.01	0.03	21020.9	34.29	37	35	10	364	"12/31/1991" "12/29/1992"	
"MT00"	"Annual"	1993	1.02	0.2	2.31	0.01	0.03	24932.8	34.52	96	36	26	371	"12/29/1992" "01/04/1994"	
"MT00"	"Annual"	1994	0.98	0.22	1.92	0.02	0.02	20713.6	28.93	82	36	23	364	"01/04/1994" "01/03/1995"	
"MT00"	"Annual"	1995	1.02	0.25	1.81	0.02	0.03	22507.2	33.89	89	41	31	364	"01/03/1995" "01/02/1996"	
"MT00"	"Annual"	1996	1.03	0.32	1.78	0.02	0.02	16956.6	29.52	71	34	22	364	"01/02/1996" "12/31/1996"	
"MT00"	"Annual"	1997	1.2	0.33	1.99	0.02	0.03	14935.7	31.23	79	33	27	364	"12/31/1996" "12/30/1997"	
"MT00"	"Annual"	1998	1.34	0.17	2.12	0.03	0.04	22630.3	34.41	59	32	21	364	"12/30/1997" "12/29/1998"	
"MT00"	"Annual"	1999	1.06	0.12	1.48	0.02	0.04	19484.7	29.11	91	38	29	364	"12/29/1998" "12/28/1999"	
"MT00"	"Annual"	2000	1.04	0.15	1.52	0.01	0.03	17100.5	27.61	56	38	26	371	"12/28/1999" "01/02/2001"	
"MT00"	"Annual"	2001	0.84	0.1	1.26	0.01	0.01	12718.5	19.6	97	28	22	365	"01/02/2001" "01/02/2002"	
"MT00"	"Annual"	2002	1.31	0.11	1.47	0.01	0.01	15052.7	25.06	78	33	22	362	"01/02/2002" "12/30/2002"	

AQ4: Air Quality Appendix Figures

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Chapter 4

- 4.3.1-1 Annual NO₂ MAAQS chart
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Data Used For Chapter 4 Air Quality Appendix Figures

4.3.1-1 Annual NO₂ MAAQS

Annual NO ₂		Modeled NO ₂
	Background NO ₂	
Montana CBNG sources	6	21.3
Wyoming CBNG sources	6	17.2
Cumulative sources	6	23.9

4.3.1-2 1 hour NO₂ MAAQS

1 hour NO ₂		
	Background NO ₂	Modeled NO ₂
Montana CBNG sources	75	258.5
Wyoming CBNG sources	75	237.7
Cumulative sources	75	263.5

4.3.1-3 NO₂ PSD Class I

PSD at Northern Cheyenne Reservation (Class I)	
	Modeled NO ₂
Montana CBNG sources	0.1
Wyoming CBNG sources	0.4
Cumulative CBNG sources	0.5

4.3.1-4 NO₂ PSD Class II

PSD at Class II areas	
	Modeled NO ₂
Montana CBNG sources	21.3
Wyoming CBNG sources	17.2
Cumulative CBNG sources	22.5

AQ5: Nitrogen Dioxide Modeling Results

1.0 INTRODUCTION

At the request of the Bureau of Land Management (BLM), the Montana Department of Environmental Quality (MDEQ) reviewed nitrogen dioxide (NO_2) modeled emissions from all of the known coal bed methane (CBM) compressor stations in the Badger Hills Development as well as the known Wyoming Sources of coal bed methane development occurring within 20 kilometers of the Bitter Creek Pipelines, LLC Seven Brothers 35 Battery which is located approximately three miles east of Decker, Montana.

The modeling analysis was conducted to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) and the Montana Ambient Air Quality Standards (MAAQS) for NO_2 . The Class I/Class II Prevention of Significant Deterioration (PSD) increment was also examined. The only Class I area within 50 kilometers of these coal bed methane compressor stations is the Northern Cheyenne Indian Reservation which is located approximately 22 miles north of the nearest Montana compressor station.

2.0 MODEL SETTINGS

The dispersion model used to conduct this modeling was the EPA-approved Industrial Source Complex Short Term Version (ISCST3) model version (02035). This model is a refined dispersion model that uses detailed information regarding the region's meteorology, terrain, and local emissions sources to estimate ambient air pollutant concentration. The ISCST3 model is used extensively for permitting and regulatory analyses it is appropriate for use in estimating ground level ambient air concentrations resulting from non-reactive buoyant emissions from stationary sources with transport distances less than 50 kilometers¹.

This analysis was conducted using the ISCST3 in the regulatory default mode in which EPA-approved modeling options were selected, including:

- Stack heights adjusted for stack tip downwash;
- Buoyancy –induced dispersion;
- Final plume rise;
- Calm processing algorithm for calculating ground-level concentrations during “calm” conditions; and
- Default values for wind profile exponents and vertical potential temperature gradients.

The ISCST3 air dispersion model uses detailed information for each emission source to perform the ambient air concentrations. Each emission source identified at all the CBM compressor stations was included in the air dispersion modeling exercise as point sources. The coordinates of the emission sources are in Universal Transverse Mercator (UTM) coordinate system, and the Montana and Wyoming sources included in this analysis are located in UTM zone 13. For each of the modeled emission sources, the stack exit height, temperature, velocity, and diameter data were input into the ISCST3 model.

Table 1 of Appendix A presents the Wyoming emission sources included in the modeling analyses. The 51 Wyoming sources identified were provided to MDEQ as part of permit

¹ 40 CFR 51, Appendix W: Guidelines on Air Quality Models. EPA-450/2-78-027R.

application for the Bitter Creek Pipelines, LLC Seven Brothers 35 Battery received on December 22, 2003.

Table 2 of Appendix A identifies the Montana sources provided by Fidelity Exploration and Production Company and were identical to those submitted in the previously identified permit application.

The emissions included for the Montana and Wyoming sources are the permitted allowable emissions and not the actual emissions. Typically, NAAQS/MAAQS demonstrations are conducted using the permitted allowable emissions whereas PSD increment analyses are conducted using actual emissions from the sources. Because actual emissions for these sources were not available, the Class I/Class II increment analysis was conducted using permitted allowable emissions instead of actual emissions, which may be considered conservative because it provides a worst-case scenario.

2.1 LAND USE

Based on Auer's method of classifying land-use², the surrounding region was classified as rural, and hence, rural dispersion coefficients were used in the analysis.

2.2 RECEPTOR, BUILDING, AND SOURCE ELEVATIONS

The receptor, building, and source elevations were determined using data obtained from the United States Geological Survey (USGS) in the form of Digital Elevation Models (DEMs). The 14 Wyoming Quadrangles used in the analysis included the following: Acme; BarNDraw; Cedar Canyon; Hultz Draw; Jones Draw; Monarch; O T O Ranch; Ranchester; Roundup Draw; Sheridan; Shuler Draw; SR Springs; Wolf; and Wyarno. The 14 Montana Quadrangles used in the analysis included the following: Bar V Ranch; Bar V Ranch NE; Decker; Folks Ranch; Half Moon; Holmes Ranch; Kid Creek; Lacey Gulch; Little Bear Creek; Pearl School; Pine Butte School; Spring Gulch; Stroud Creek; and Tongue River Dam.

2.3 METEROLOGICAL DATA

EPA modeling guidelines indicate that five years of representative meteorological data should be used for regulatory dispersion analyses to ensure that worst-case meteorological conditions are represented. Five years (1984, and 1987 through 1990) of meteorological data were used in this modeling analysis. Surface meteorological data were obtained from Sheridan, Wyoming (Met Station #24029). Upper air data were obtained from Lander, Wyoming (Met Station #24021). Wind roses for this data set show that the predominant wind comes from the northwest.

2.4 BUILDING DOWNWASH

Building downwash is the effect of nearby structures on the flow of emissions from their respective sources. Building downwash was included using the USEPA – approved Schulman-Scire method. The USEPA- approved Building Profile Input Program (BPIP) was used to calculate the projected building widths and heights for the following Montana Bitter Creek Pipelines, LLC: Seven Brothers 35 Battery, Consul 27 Battery, and the Symons Central. Building downwash information was not available for the other Montana or Wyoming sources.

² Auer, Jr., "Correlation of Land Use and Cover with Meteorological Anomalies." Journal of Applied Meteorology, 17:636-643, 1978.

2.5 RECEPTORS

A Cartesian receptor grid consisting of 15,413 receptors was used in this analysis. The southwest corner of 324,000E, 4,958,000N and northeast corner of 385,000E, 5,010,000, encompassed the entire grid that consisted of 3172 km². Receptors were spaced at approximately 50-meters along the identified fence-lines of the Seven Brothers 35 Battery, the Consul 27 Battery, and the Symons Central compressor stations.

The remaining receptors were spaced at 100-meter spacing from the southwest corner of 345,000E, 4,983,000N and northeast corner of 361,000E, 4,989,000 to encompass all of the Montana stations, at 250-meter spacing from the southwest corner of 344,000E, 4,982,000N and northeast corner of 362,000E, 4,990,000, at 500-meter spacing from the southwest corner of 335,000E, 4,975,000N and northeast corner of 371,000E, 5,000,000, and at 1000-meter spacing from spacing from the southwest corner of 315,000E, 4,950,000N and northeast corner of 385,000E, 5,025,000.

Additionally, a receptor grid consisting of 250 receptors was previously developed using USGS maps for the Northern Cheyenne Indian Reservation. The receptors were placed at an approximate spacing of 100 meters

3.0 MODELING METHODOLOGY

The pollutant of concern for this analysis was NOx. It has been found that the NOx emissions are the limiting pollutant from the compressor stations i.e., the most likely pollutant to violate any ambient standard or increment. Thus, only NOx emissions were examined. The emissions of total NOx (NO +NO₂) from each source were assumed as the basis for the model. The model was run for the years 1984 and 1987-1990.

The highest modeled NOx annual concentration and the high-second-high 1-hour concentration were determined. Once the highest NOx concentrations were determined, the Ambient Ratio Method (ARM) and the Ozone Limiting Method (OLM) were applied to the NOx modeled concentrations in order to convert to NO₂ concentrations for comparison against the NAAQS/MAAQS and PSD increment. These two methods take into account the complexity of the chemistry affecting the formation of NO₂.

The ARM was applied, using a national default value of 75%. The formula for applying the OLM is:

$$[\text{NO}_2]_{\text{OLM}} = \{\{0.1 * [\text{NOx}]\} + \{\text{MIN } \{(0.9) * [\text{NOx}]_{\text{pred}}, \text{ or } (46/48) * [\text{O}_3]_{\text{bkgd}}\} + [\text{NO}_2]_{\text{bkgd}}\}\}$$

The background concentration of ozone (O₃) is assumed at 196 µg/m³, which is equivalent to Montana's 1-hour ambient standard and maybe considered to provide a worst-case scenario.

4.0 AMBIENT AIR QUALITY MODELING ANALYSIS RESULTS

The following sections describe the air dispersion modeling results in terms of annual and high-second-high 1-hour results for NO₂. The results include the total modeled concentration as well as the Montana and Wyoming individual source contributions. The annual NAAQS for NO₂ is 100 µg/m³ while the annual MAAQS is 94 µg/m³ and the 1-hour standard is 564 µg/m³. The results are tabulated in Table 4-1 below.

Table 4-1. Ambient Modeling Results for NO₂

NOx Average	Source Group	Rank	Modeled Conc. (µg/m ³)	UTM East (X) (m)	UTM North (Y) (m)	OLM ^a /ARM ^b (µg/m ³)	Background (µg/m ³)	Ambient Conc. (µg/m ³)	% of NAAQS	% of MAAQS
1984										
ANNUAL	ALL	1ST	28.6	357800	4984100	21.4	6	27.4	27.4	29.2
ANNUAL	MT_SRC	1ST	26.8	357800	4984100	20.1	6	26.1	26.1	27.8
ANNUAL	WY_SRC	1ST	22.0	352000	4978500	16.5	6	22.5	22.5	23.9
1HR	ALL	2ND	578.8	357500	4984000	245.7	75	320.7	----	56.9
1HR	MT_SRC	2ND	578.8	357500	4984000	245.7	75	320.7	----	56.9
1HR	WY_SRC	2ND	498.5	353500	4981000	237.7	75	312.7	----	55.4
1987										
ANNUAL	ALL	1ST	27.0	357800	4984100	20.2	6	26.2	26.2	27.9
ANNUAL	MT_SRC	1ST	25.2	357800	4984100	18.9	6	24.9	24.9	26.4
ANNUAL	WY_SRC	1ST	22.9	352000	4978500	17.2	6	23.2	23.2	24.7
1HR	ALL	2ND	627.8	357400	4984000	250.6	75	325.6	----	57.7
1HR	MT_SRC	2ND	627.8	357400	4984000	250.6	75	325.6	----	57.7
1HR	WY_SRC	2ND	497.9	353500	4981000	237.6	75	312.6	----	55.4
1988										
ANNUAL	ALL	1ST	30.0	357800	4984100	22.5	6	28.5	28.5	30.3
ANNUAL	MT_SRC	1ST	28.4	357800	4984100	21.3	6	27.3	27.3	29.0
ANNUAL	WY_SRC	1ST	20.8	352000	4978500	15.6	6	21.6	21.6	23.0
1HR	ALL	2ND	627.6	357400	4984000	250.6	75	325.6	----	57.7
1HR	MT_SRC	2ND	627.6	357400	4984000	250.6	75	325.6	----	57.7
1HR	WY_SRC	2ND	487.2	353500	4981000	236.6	75	311.6	----	55.2
1989										
ANNUAL	ALL	1ST	25.7	357800	4984100	19.2	6	25.2	25.2	26.9
ANNUAL	MT_SRC	1ST	24.0	357800	4984100	18.0	6	24.0	24.0	25.5
ANNUAL	WY_SRC	1ST	22.2	352000	4978500	16.6	6	22.6	22.6	24.1
1HR	ALL	2ND	570.0	357500	4984000	244.8	75	319.8	----	56.7
1HR	MT_SRC	2ND	570.0	357500	4984000	244.8	75	319.8	----	56.7
1HR	WY_SRC	2ND	486.4	352000	4978500	236.5	75	311.5	----	55.2
1990										
ANNUAL	ALL	1ST	26.4	357800	4984100	19.8	6	25.8	25.8	27.5
ANNUAL	MT_SRC	1ST	24.8	357800	4984100	18.6	6	24.6	24.6	26.2
ANNUAL	WY_SRC	1ST	22.0	352000	4978500	16.5	6	22.5	22.5	23.9
1HR	ALL	2ND	706.9	357400	4983900	258.5	75	333.5	----	59.1
1HR	MT_SRC	2ND	706.9	357400	4983900	258.5	75	333.5	----	59.1
1HR	WY_SRC	2ND	489.5	353500	4981000	236.8	75	311.8	----	55.3

^aConcentration calculated using the Ozone Limiting Method.^bApplying the Ambient Ratio Method with National Default of 75%.

The annual high NO₂ concentration occurred in 1988 approximately 150 meters southeast of the Symons Central compressor station. While the second high 1-hour modeled NO₂ concentration occurred in 1990 approximately 300 meters southwest of the Symons Central compressor station. The modeled concentrations are well below the NAAQS/MAAQS even with the added background concentrations. The background concentrations used in this analysis are those, which Montana uses as default values for areas where no significant sources exist such as in this case.

A Class I/Class II PSD increment analysis was conducted using the same sources as previously identified with the same emission rates. Class I/Class II increment analyses are normally modeled using the actual emissions from each individual source. This analysis maybe considered conservative because allowable emissions were used in lieu of actual emissions for the Montana sources. It is assumed that all the sources are increment-consuming sources.

The results of the Class I analysis for the Northern Cheyenne Indian Reservation are shown in Table 4-2.

Table 4-2. Class I Modeling Results

Source Group	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	UTM East (X) (m)	UTM North (Y) (m)	Elevation (m)	ARM ^a ($\mu\text{g}/\text{m}^3$)	Class I Increment ($\mu\text{g}/\text{m}^3$)	% of Class I Increment
1984							
ALL	0.66	343855	5023989	1189	0.5	2.5	19.8
MT_SRC	0.14	344275.3	5023993	1137	0.1	2.5	4.3
WY_SRC	0.55	343855	5023989	1189	0.4	2.5	16.4
1987							
ALL	0.70	343855	5023989	1189	0.5	2.5	21.0
MT_SRC	0.16	344275.3	5023993	1137	0.1	2.5	4.7
WY_SRC	0.58	343855	5023989	1189	0.4	2.5	17.4
1988							
ALL	0.69	344275.3	5023993	1137	0.5	2.5	20.8
MT_SRC	0.15	344275.3	5023993	1137	0.1	2.5	4.4
WY_SRC	0.57	343855	5023989	1189	0.4	2.5	17.1
1989							
ALL	0.70	344275.3	5023993	1137	0.5	2.5	20.9
MT_SRC	0.15	344275.3	5023993	1137	0.1	2.5	4.5
WY_SRC	0.57	343855	5023989	1189	0.4	2.5	17.0
1990							
ALL	0.66	343855	5023989	1189	0.5	2.5	19.7
MT_SRC	0.15	344275.3	5023993	1137	0.1	2.5	4.4
WY_SRC	0.55	343855	5023989	1189	0.4	2.5	16.4

^aApplying the Ambient Ratio Method with National Default of 75%.

As shown in the Table 4-2, the Wyoming sources are the major contributor to the modeled Class I increment. The results of the Class II modeling are shown in Table 4-3.

Table 4-3. Class II Modeling Results

Source Group	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	East (X) (m)	North (Y) (m)	Elevation (m)	ARM ^a ($\mu\text{g}/\text{m}^3$)	Class II Increment ($\mu\text{g}/\text{m}^3$)	% of Class II Increment
1984							
ALL	28.6	357800	4984100	1085	21.4	25	85.7
MT_SRC	26.8	357800	4984100	1085	20.1	25	80.5
WY_SRC	22.0	352000	4978500	1132	16.5	25	65.9
1987							
ALL	27.0	357800	4984100	1085	20.2	25	80.9
MT_SRC	25.2	357800	4984100	1085	18.9	25	75.5
WY_SRC	22.9	352000	4978500	1132	17.2	25	68.7
1988							
ALL	30.0	357800	4984100	1085	22.5	25	89.9
MT_SRC	28.4	357800	4984100	1085	21.3	25	85.2
WY_SRC	20.8	352000	4978500	1132	15.6	25	62.4
1989							
ALL	25.7	357800	4984100	1085	19.2	25	77.0
MT_SRC	24.0	357800	4984100	1085	18.0	25	71.9
WY_SRC	22.2	352000	4978500	1132	16.6	25	66.6
1990							
ALL	26.4	357800	4984100	1085	19.8	25	79.3
MT_SRC	24.8	357800	4984100	1085	18.6	25	74.4
WY_SRC	22.0	352000	4978500	1132	16.5	25	66.0

^aApplying the Ambient Ratio Method with National Default of 75%.

The peak-modeled concentration for the Class II increment occurred in 1988 approximately 150 meters southeast of the Symons Central compressor station, which is the same receptor where the peak modeled ambient concentration, was observed.

5.0 CONCLUSIONS

As shown in Tables 4-1, 4-2 and 4-3, the coal bed methane development to date complies with the NAAQS, MAAQS, and PSD Class I/Class II increments. Peak modeled concentrations are observed close to individual developments. Future sources should be modeled as development continues to ensure that no standards or increments are exceeded.

MDEQ requires air dispersion modeling for all coal bed methane sources in Montana that trigger permitting requirements. MDEQ reviews the air dispersion modeling and will ensure that all known sources located in Montana and sources located in Wyoming that are likely to contribute to peak modeled concentrations are included in any future modeling analyses to ensure that the ambient standards or Class I/Class II increments are not exceeded.

As requested, the model was rerun with the addition of Spring Creek and Decker Coal mines. These mines were added as area sources with NOx emissions of 701 tons per year for the Decker mine and 567 tpy for the Spring Creek Mine. The NOx emissions from the mines are fugitive emissions and result from gaseous emissions (i.e., emissions from vehicle exhaust (diesel and gasoline) and explosives detonations). The only adjustments made to the model included deleting some receptors that would fall inside the areas designated as the area source locations at the mines. Instead of 15,413 receptors, this analysis included 13,596. The 1,817 receptors deleted would all have fallen inside the areas designated as the area source. The results did not change substantially as shown in the following table 4-1a.

Table 4-1a. Ambient Modeling Results for NO₂ - CBM Sources and Spring Creek and Decker Mines

NOx Average	Source Group	Rank	Modeled Conc. ($\mu\text{g}/\text{m}^3$)	UTM East (X) (m)	UTM North (Y) (m)	OLM ^a /ARM ^b ($\mu\text{g}/\text{m}^3$)	Back ground ($\mu\text{g}/\text{m}^3$)	Ambient Conc. ($\mu\text{g}/\text{m}^3$)	% of NAAQS	% of MAAQS
1984										
ANNUAL	ALL	1ST	30.72162	357800	4984100	23.04122	6	29.0	29.0	30.9
ANNUAL	MT_SRC	1ST	28.9727	357800	4984100	21.72953	6	27.7	27.7	29.5
ANNUAL	WY_SRC	1ST	21.96286	352000	4978500	16.47215	6	22.5	22.5	23.9
IHR	ALL	2ND	614.7131	357500	4984000	249.3046	75	324.3	----	57.5
IHR	MT_SRC	2ND	614.7131	357500	4984000	249.3046	75	324.3	----	57.5
IHR	WY_SRC	2ND	498.5097	353500	4981000	237.6843	75	312.7	----	55.4
1987										
ANNUAL	ALL	1ST	29.07294	357800	4984100	21.80471	6	27.8	27.8	29.6
ANNUAL	MT_SRC	1ST	27.26707	357800	4984100	20.4503	6	26.5	26.5	28.1
ANNUAL	WY_SRC	1ST	22.90586	352000	4978500	17.1794	6	23.2	23.2	24.7
IHR	ALL	2ND	658.1212	357400	4984000	253.6454	75	328.6	----	58.3
IHR	MT_SRC	2ND	658.1212	357400	4984000	253.6454	75	328.6	----	58.3
IHR	WY_SRC	2ND	497.9269	353500	4981000	237.626	75	312.6	----	55.4
1988										
ANNUAL	ALL	1ST	31.82916	357800	4984100	23.87187	6	29.9	29.9	31.8
ANNUAL	MT_SRC	1ST	30.26383	357800	4984100	22.69787	6	28.7	28.7	30.5
ANNUAL	WY_SRC	1ST	20.79077	352000	4978500	15.59308	6	21.6	21.6	23.0
IHR	ALL	2ND	652.425	357400	4984000	253.0758	75	328.1	----	58.2
IHR	MT_SRC	2ND	652.425	357400	4984000	253.0758	75	328.1	----	58.2
IHR	WY_SRC	2ND	487.2192	353500	4981000	236.5553	75	311.6	----	55.2
1989										
ANNUAL	ALL	1ST	27.31772	357800	4984100	20.48829	6	26.5	26.5	28.2
ANNUAL	MT_SRC	1ST	25.63042	357800	4984100	19.22282	6	25.2	25.2	26.8
ANNUAL	WY_SRC	1ST	22.19694	352000	4978500	16.64771	6	22.6	22.6	24.1
IHR	ALL	2ND	606.0254	357500	4984000	248.4359	75	323.4	----	57.3
IHR	MT_SRC	2ND	606.0254	357500	4984000	248.4359	75	323.4	----	57.3
IHR	WY_SRC	2ND	486.3996	352000	4978500	236.4733	75	311.5	----	55.2
1990										
ANNUAL	ALL	1ST	28.35327	357800	4984100	21.26495	6	27.3	27.3	29.0
ANNUAL	MT_SRC	1ST	26.69258	357800	4984100	20.01944	6	26.0	26.0	27.7
ANNUAL	WY_SRC	1ST	21.98359	352000	4978500	16.48769	6	22.5	22.5	23.9
IHR	ALL	2ND	757.098	357400	4983900	263.5431	75	338.5	----	60.0
IHR	MT_SRC	2ND	757.098	357400	4983900	263.5431	75	338.5	----	60.0
IHR	WY_SRC	2ND	489.5041	353500	4981000	236.7837	75	311.8	----	55.3

^aConcentration calculated using the Ozone Limiting Method.

^bApplying the Ambient Ratio Method with National Default of 75%.

APPENDIX A

Table 1. Wyoming Sources Included in Modeling Analysis**Zone Searched: 13****UTM (Easting) Searched: 356328****UTM (Northing) Searched: 4986387****Search Radius: 20 kilometers**

Number of Facilities Identified: 51

Company - Facility	NO _x		Formaldehyde		Distance From Proposed Source	Facility UTM	
	2106.39	TPY Total	159.26	TPY Total		Easting	Northing
Bear Paw Energy Incorporated - Prairie Dog Gathering System - Pod A	20.47	TPY	4.09	TPY	7.2	km	354934.28 4979329.5
Bear Paw Energy Incorporated - Prairie Dog Gathering System - Pod B	15.35	TPY	3.07	TPY	8.1	km	354361.78 4978522.5
Bear Paw Energy Incorporated - Prairie Dog Gathering System - Pod C	27.03	TPY	5.4	TPY	8.4	km	353005.7 4978626
Bear Paw Energy Incorporated - Prairie Dog Gathering System - Pod D	34.76	TPY	6.95	TPY	9.1	km	351903.3 4978418.5
Bear Paw Energy Incorporated - Prairie Dog Gathering System - Pod E	27.03	TPY	5.4	TPY	9.8	km	353173.9 4977139.5
Bear Paw Energy Incorporated - Prairie Dog Pod EE Compressor Station	11.58	TPY	0.7	TPY	9	km	355199.2 4977421.3
Bear Paw Energy Incorporated - Prairie Dog Pod F	38.62	TPY	2.29	TPY	7.5	km	355832.2 4978922.5
Bear Paw Energy Incorporated - Prairie Dog Pod J (Formerly Station 21)	30.9	TPY	1.86	TPY	13.6	km	351210.2 4973801.4
Bear Paw Energy Incorporated - Prairie Dog Pod K (Formerly Station 28)	38.62	TPY	2.33	TPY	6	km	353733 4981015
Bear Paw Energy Incorporated - Prairie Dog Pod L	19.31	TPY	0.97	TPY	10.1	km	349272.4 4979203.9
Bear Paw Energy Incorporated - Prairie Dog Pod N	43.64	TPY	2.43	TPY	10.7	km	347633 4980115
Bear Paw Energy Incorporated - Prairie Dog Pod P	43.64	TPY	2.43	TPY	13.5	km	349393 4974855
Bear Paw Energy Incorporated - Station 17	50.21	TPY	3.03	TPY	13	km	351005.8 4974537
Bear Paw Energy Incorporated - Station 36	42.48	TPY	2.56	TPY	6.4	km	356934.5 4979992.4
Bear Paw Energy Incorporated - Station 5	50.21	TPY	3.03	TPY	9.4	km	351120.8 4978522.6
Bear Paw Energy Incorporated - Station 8	38.62	TPY	2.33	TPY	11	km	350818.9 4976873.5
Bear Paw Energy, L.L.C. - Prairie Dog Booster (Station 9)	194.68	TPY	9.72	TPY	10.4	km	352000.1 4976917.6
Bitter Creek Pipelines LLC - Beatty Gulch Central Compressor Station	81.12	TPY	4.87	TPY	18.8	km	347081.6 4970060.3
Bitter Creek Pipelines LLC - Chevron 19 Battery	7.72	TPY	1.54	TPY	8.1	km	348888 4983122
Bitter Creek Pipelines LLC - Chevron 20 Battery	7.72	TPY	1.54	TPY	6.3	km	350782 4983464
Bitter Creek Pipelines LLC - Chevron 30 Battery	7.72	TPY	1.54	TPY	9.2	km	348544 4981404
Bitter Creek Pipelines LLC - DeLapp 27 Compressor Station	11.59	TPY	3.2	TPY	13.9	km	343413 4981222
Bitter Creek Pipelines LLC - Dewey 21 Battery	27.79	TPY	4.14	TPY	4.8	km	352564 4983439
Bitter Creek Pipelines LLC - Dewey 27 Battery	27.79	TPY	4.14	TPY	5.6	km	353201 4981714
Bitter Creek Pipelines LLC - Dewey 28 Battery	23.93	TPY	3.37	TPY	7	km	351875 4980987
Bitter Creek Pipelines LLC - Dunning 32 Battery	32.03	TPY	4.29	TPY	8.5	km	349929 4980810
Bitter Creek Pipelines LLC - Gladewater Central Station	154.44	TPY	8.27	TPY	8.3	km	351578 4979635
Bitter Creek Pipelines LLC - Koltiska 31 Battery	11.59	TPY	0.58	TPY	17.3	km	348894 4970746
Bitter Creek Pipelines LLC - Koltiska 32 Battery	11.59	TPY	0.58	TPY	17	km	350251 4970554
Bitter Creek Pipelines LLC - Mischke 24 Battery	20.07	TPY	1.59	TPY	3.4	km	356344 4982950
Bitter Creek Pipelines LLC - RC23 Battery	7.72	TPY	1.54	TPY	10.8	km	345976 4983285
Bitter Creek Pipelines LLC - RC24 Battery	7.72	TPY	1.54	TPY	8.9	km	347886 4983715
Bitter Creek Pipelines LLC - RC25 Battery	7.72	TPY	1.54	TPY	10	km	347446 4981795

Company - Facility	NO _x		Formaldehyde		Distance From Proposed Source		Facility UTM	
	2106.39	TPY Total	159.26	TPY Total			Easting	Northing
Bitter Creek Pipelines LLC - RC26 Battery	7.72	TPY	1.54	TPY	12.1	km	345266	4981395
Bitter Creek Pipelines LLC - Seven Brothers 1 Battery	11.59	TPY	2.74	TPY	19.3	km	348679	4968700
Bitter Creek Pipelines LLC - State #26 Battery	11.59	TPY	2.29	TPY	17.4	km	345801	4972595
Bitter Creek Pipelines LLC - State #36 Battery	11.59	TPY	2.29	TPY	18.2	km	346451	4971045
Bitter Creek Pipelines LLC - Trembath 25 Battery	23.93	TPY	3.37	TPY	4.9	km	356983	4981531
CMS Field Services - Badger Creek A Compressor Station	43.93	TPY	3.09	TPY	17.4	km	362326.6	4970006.5
CMS Field Services - Badger Creek B Compressor Station	43.93	TPY	3.09	TPY	19.6	km	366582.9	4969669.5
CMS Field Services - Badger Creek C Compessor Station	43.93	TPY	3.09	TPY	19.6	km	361691.1	4967517.5
CMS Field Services - Badger Creek D Compressor Station	43.93	TPY	3.09	TPY	19.9	km	364501.5	4968280.5
CMS Field Services - Prairie Dog A Compressor Station	43.93	TPY	3.14	TPY	13.8	km	353113.3	4972941
CMS Field Services - Prairie Dog B Compressor Station	43.93	TPY	3.14	TPY	15.2	km	352076.2	4971807
CMS Field Services - Prairie Dog C Compressor Station	43.93	TPY	3.14	TPY	17.4	km	352908.9	4969334.5
CMS Field Services - Prairie Dog E Compressor Station	43.93	TPY	3.14	TPY	19.7	km	353242.6	4966946
MegaEnergy Generating, LLC - Prairie Dog Gen Site 1	144.65	TPY	5.28	TPY	7.5	km	355919.5	4978934
MegaEnergy Generating, LLC - Prairie Dog Gen Site 2	144.65	TPY	5.28	TPY	10.3	km	352106	4977011.5
MegaEnergy Generating, LLC - Prairie Dog Gen Site 3	144.65	TPY	5.28	TPY	10.6	km	349251.8	4978491
MegaEnergy Generating, LLC - Prairie Dog Gen Site 4	79.17	TPY	3.41	TPY	13.7	km	351228	4973724

Table 2. Montana Sources (01/05/2004) - Fidelity Exploration and Production Company

Facility	Permit Number	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	NOX (g/s)
Symons Central	3250-00	7044 GSI	357499	4984324	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	7044 GSI	357516	4984316	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	7044 GSI	357532	4984308	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	7044 GSI	357548	4984300	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	7044 GSI	357565	4984291	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	7044 GSI	357581	4984283	1058	9.3	805	27.83002	0.3962	0.467
Symons Central	3250-00	3524 GSI or Equivalent	357681	4984293	1052	6.858	895.37	45.29328	0.3255	0.233
Symons Central	3250-00	3524 GSI or Equivalent	357676	4984284	1052	6.858	895.37	45.29328	0.3255	0.233
Visborg 25	unpermitted ?	F18 GL	359797	4985042	1099.4	6.48	772	37.89483	0.2042	0.222
Visborg 25		F18 GL	359797	4985051	1100	6.48	772	37.89483	0.2042	0.222
Montana State 36	unpermitted ?	F18 GL	360510	4985042	1128.9	6.48	772	37.89483	0.2042	0.222
Montana State 36		F18 GL	360510	4985051	1128.6	6.48	772	37.89483	0.2042	0.222
Connor 33	3140-01	F18 GL	355211	4984092	1099.5	6.48	772	37.89483	0.2042	0.222
Connor 33	3140-01	F18 GL	355211	4984101	1098.9	6.48	772	37.89483	0.2042	0.222
Connor 33	3140-01	F18 GL	355211	4984110	1098.3	6.48	772	37.89483	0.2042	0.222
Connor 33	3140-01	F18 GL	355211	4984119	1097.7	6.48	772	37.89483	0.2042	0.222
Connor 33	3140-01	F18 GL	355211	4984128	1097.2	6.48	772	37.89483	0.2042	0.222
CX-14	3141-01	F18 GL	348589	4989024	1126.9	6.48	772	37.89483	0.2042	0.222
CX-14	3141-01	F18 GL	348589	4989033	1126.2	6.48	772	37.89483	0.2042	0.222
CX-14	3141-01	F18 GL	348589	4989042	1125.6	6.48	772	37.89483	0.2042	0.222
CX-19	3118-01	F18 GL	352007	4988296	1134.1	6.48	772	37.89483	0.2042	0.222
CX-19	3118-01	F18 GL	352007	4988305	1134.5	6.48	772	37.89483	0.2042	0.222
CX-24	3036-03	G3408 TA	350100	4987709	1115	5.49	783	35.4	0.152	0.219
CX-24	3036-03	F18 GL	350100	4987718	1114.7	6.48	772	37.89483	0.2042	0.222
CX-24	3036-03	G3408 TA	350100	4987727	1114.4	5.49	783	35.4	0.152	0.219
CX-25	3037-02	G3408 TA	350296	4986007	1102.7	5.49	783	35.4	0.152	0.219
CX-25	3037-02	G3408 TA	350296	4986016	1103.8	5.49	783	35.4	0.152	0.219
CX-25	3037-02	F18 GL	350296	4986025	1104.9	6.48	772	37.89483	0.2042	0.222
CX-35	3122-01	F18 GL	348825	4985297	1111.7	6.48	772	37.89483	0.2042	0.222
CX-35	3122-01	F18 GL	348825	4985306	1112.3	6.48	772	37.89483	0.2042	0.222
Shell 33	3119-01	F18 GL	345725	4985269	1123.8	6.48	772	37.89483	0.2042	0.222
Shell 33	3119-01	F18 GL	345725	4985278	1124.4	6.48	772	37.89483	0.2042	0.222
School House	3035-02	F18 GL	353428	4984496	1077.9	6.48	772	37.89483	0.2042	0.222
School House	3035-02	F18 GL	353428	4984505	1079.1	6.48	772	37.89483	0.2042	0.222
Squirrel Creek	3038-01	G3408 TA	352353	4986828	1079.9	5.49	783	35.4	0.152	0.219
Squirrel Creek	3038-01	G3408 TA	352353	4986837	1079.9	5.49	783	35.4	0.152	0.219
Squirrel Creek	3038-01	F18 GL	352353	4986846	1079.9	6.48	772	37.89483	0.2042	0.222
Stateline	3070-02	G3408 TA	351431	4984715	1066.8	5.49	783	35.4	0.152	0.219
Stateline	3070-02	G3408 TA	351431	4984724	1066.6	5.49	783	35.4	0.152	0.219
Stateline	3070-02	F18 GL	351431	4984733	1066.5	6.48	772	37.89483	0.2042	0.222
Seven Brothers 35	3297-00	F18 GL	357688	4985065	1099	6.48	772	37.895	0.2042	0.11088
Seven Brothers 35	3297-00	F18 GL	357688	4985074	1099	6.48	772	37.895	0.2042	0.11088
Seven Brothers 35	3297-00	F18 GL	357688	4985083	1099	6.48	772	37.895	0.2042	0.11088
Seven Brothers 35	3297-00	F18 GL	357688	4985092	1099	6.48	772	37.895	0.2042	0.11088
Seven Brothers 35	3297-00	F18 GL	357688	4985101	1099	6.48	772	37.895	0.2042	0.11088
Seven Brothers 35	3297-00	F18 GL	357688	4985110	1099	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356328	4986387	1063	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356319	4986387	1063	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356310	4986387	1063	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356301	4986387	1063	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356292	4986387	1063	6.48	772	37.895	0.2042	0.11088
Consul27	3298-00	F18 GL	356283	4986387	1063	6.48	772	37.895	0.2042	0.11088

Table 3. Summary Results of Model (CBM Sources Only)

Receptor grid did not extend out to encompass 1 ug/m³ ROI

I used 28 USGS maps to extend approximately 30 kilometers. I determined extending the receptor grid beyond that may not be representative of 50 km since there are likely sources in Wyoming that would not be included,

Results

ANNUAL

Model	File	Pol	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File	Sources	Groups	Rec.
1 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	ANNUAL	ALL	1ST	28.57641	357800	4984100	1085.39	1 YRS	SHRLND84.ASC	354	3	15413
2 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	ANNUAL	MT_SRC	1ST	26.82722	357800	4984100	1085.39	1 YRS	SHRLND84.ASC	354	3	15413
3 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	ANNUAL	WY_SRC	1ST	21.96286	352000	4978500	1132.33	1 YRS	SHRLND84.ASC	354	3	15413
10 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	ANNUAL	ALL	1ST	26.95625	357800	4984100	1085.39	1 YRS	SHRLND87.ASC	354	3	15413
11 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	ANNUAL	MT_SRC	1ST	25.15017	357800	4984100	1085.39	1 YRS	SHRLND87.ASC	354	3	15413
12 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	ANNUAL	WY_SRC	1ST	22.90586	352000	4978500	1132.33	1 YRS	SHRLND87.ASC	354	3	15413
19 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	ANNUAL	ALL	1ST	29.96168	357800	4984100	1085.39	1 YRS	SHRLND88.ASC	354	3	15413
20 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	ANNUAL	MT_SRC	1ST	28.39618	357800	4984100	1085.39	1 YRS	SHRLND88.ASC	354	3	15413
21 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	ANNUAL	WY_SRC	1ST	20.79077	352000	4978500	1132.33	1 YRS	SHRLND88.ASC	354	3	15413
28 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	ANNUAL	ALL	1ST	25.66219	357800	4984100	1085.39	1 YRS	SHRLND89.ASC	354	3	15413
29 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	ANNUAL	MT_SRC	1ST	23.97473	357800	4984100	1085.39	1 YRS	SHRLND89.ASC	354	3	15413
30 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	ANNUAL	WY_SRC	1ST	22.19694	352000	4978500	1132.33	1 YRS	SHRLND89.ASC	354	3	15413
37 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	ANNUAL	ALL	1ST	26.44763	357800	4984100	1085.39	1 YRS	SHRLND90.ASC	354	3	15413
38 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	ANNUAL	MT_SRC	1ST	24.78666	357800	4984100	1085.39	1 YRS	SHRLND90.ASC	354	3	15413
39 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	ANNUAL	WY_SRC	1ST	21.98359	352000	4978500	1132.33	1 YRS	SHRLND90.ASC	354	3	15413

1-hour

Model	File	Pol	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File	Sources	Groups	Rec.
4 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	ALL	1ST	640.31909	357400	4984100	1093.01	84102722	SHRLND84.ASC	354	3	15413
5 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	ALL	2ND	578.76898	357500	4984000	1094.23	84122101	SHRLND84.ASC	354	3	15413
6 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	MT_SRC	1ST	640.31909	357400	4984100	1093.01	84102722	SHRLND84.ASC	354	3	15413
7 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	MT_SRC	2ND	578.76898	357500	4984000	1094.23	84122101	SHRLND84.ASC	354	3	15413
8 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	WY_SRC	1ST	499.85983	353500	4981000	1133.55	84070224	SHRLND84.ASC	354	3	15413
9 ISCST3	BLM_CBM_2_84_NOX.USF	NOX	1-HR	WY_SRC	2ND	498.5097	353500	4981000	1133.55	84122701	SHRLND84.ASC	354	3	15413
13 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	ALL	1ST	628.06696	357400	4984000	1097.58	87030702	SHRLND87.ASC	354	3	15413
14 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	ALL	2ND	627.82294	357400	4984000	1097.58	87050703	SHRLND87.ASC	354	3	15413
15 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	MT_SRC	1ST	628.06696	357400	4984000	1097.58	87030702	SHRLND87.ASC	354	3	15413
16 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	MT_SRC	2ND	627.82294	357400	4984000	1097.58	87050703	SHRLND87.ASC	354	3	15413
17 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	WY_SRC	1ST	498.54401	353500	4981000	1133.55	87052302	SHRLND87.ASC	354	3	15413
18 ISCST3	BLM_CBM_2_87_NOX.USF	NOX	1-HR	WY_SRC	2ND	497.92694	353500	4981000	1133.55	87111618	SHRLND87.ASC	354	3	15413
22 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	ALL	1ST	631.21698	357400	4984000	1097.58	88010606	SHRLND88.ASC	354	3	15413
23 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	ALL	2ND	627.60919	357400	4984000	1097.58	88082406	SHRLND88.ASC	354	3	15413
24 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	MT_SRC	1ST	631.21698	357400	4984000	1097.58	88010606	SHRLND88.ASC	354	3	15413
25 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	MT_SRC	2ND	627.60919	357400	4984000	1097.58	88082406	SHRLND88.ASC	354	3	15413
26 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	WY_SRC	1ST	488.41241	352000	4978500	1132.33	88022523	SHRLND88.ASC	354	3	15413
27 ISCST3	BLM_CBM_2_88_NOX.USF	NOX	1-HR	WY_SRC	2ND	487.21918	353500	4981000	1133.55	88012721	SHRLND88.ASC	354	3	15413
31 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	ALL	1ST	577.27014	357500	4984000	1094.23	89030603	SHRLND89.ASC	354	3	15413
32 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	ALL	2ND	569.95868	357500	4984000	1094.23	89050105	SHRLND89.ASC	354	3	15413
33 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	MT_SRC	1ST	577.27014	357500	4984000	1094.23	89030603	SHRLND89.ASC	354	3	15413
34 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	MT_SRC	2ND	569.95868	357500	4984000	1094.23	89050105	SHRLND89.ASC	354	3	15413

1-hour														
Model	File	Pol	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File	Sources	Groups	Rec.
35 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	WY_SRC	1ST	499.28867	353500	4981000	1133.55	89091923	SHRLND89.ASC	354	3	15413
36 ISCST3	BLM_CBM_2_89_NOX.USF	NOX	1-HR	WY_SRC	2ND	486.39963	352000	4978500	1132.33	89102922	SHRLND89.ASC	354	3	15413
40 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	ALL	1ST	718.67285	357400	4983900	1108.56	90032501	SHRLND90.ASC	354	3	15413
41 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	ALL	2ND	706.89929	357400	4983900	1108.56	90021823	SHRLND90.ASC	354	3	15413
42 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	MT_SRC	1ST	718.67285	357400	4983900	1108.56	90032501	SHRLND90.ASC	354	3	15413
43 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	MT_SRC	2ND	706.89929	357400	4983900	1108.56	90021823	SHRLND90.ASC	354	3	15413
44 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	WY_SRC	1ST	495.75235	353500	4981000	1133.55	90091424	SHRLND90.ASC	354	3	15413
45 ISCST3	BLM_CBM_2_90_NOX.USF	NOX	1-HR	WY_SRC	2ND	489.50409	353500	4981000	1133.55	90111620	SHRLND90.ASC	354	3	15413

Class II - same Results since all sources are increment consuming

Class I														
Model	File	Pol	Average	Group	Rank	Conc.	East(X)	North(Y)	Elev	Time	Met File	Sources	Groups	Rec.
1 ISCST3	BLM_CBM_ClassI_84_NOX.UNOX	ANNUAL	ALL	1ST		0.65979	343855	5023989	1188.72	1 YRS	SHRLND84.ASC	354	3	250
2 ISCST3	BLM_CBM_ClassI_84_NOX.UNOX	ANNUAL	MT_SRC	1ST		0.14245	344275	5023993	1137	1 YRS	SHRLND84.ASC	354	3	250
3 ISCST3	BLM_CBM_ClassI_84_NOX.UNOX	ANNUAL	WY_SRC	1ST		0.54698	343855	5023989	1188.72	1 YRS	SHRLND84.ASC	354	3	250
4 ISCST3	BLM_CBM_ClassI_87_NOX.UNOX	ANNUAL	ALL	1ST		0.70161	343855	5023989	1188.72	1 YRS	SHRLND87.ASC	354	3	250
5 ISCST3	BLM_CBM_ClassI_87_NOX.UNOX	ANNUAL	MT_SRC	1ST		0.15611	344275	5023993	1137	1 YRS	SHRLND87.ASC	354	3	250
6 ISCST3	BLM_CBM_ClassI_87_NOX.UNOX	ANNUAL	WY_SRC	1ST		0.57921	343855	5023989	1188.72	1 YRS	SHRLND87.ASC	354	3	250
7 ISCST3	BLM_CBM_ClassI_88_NOX.UNOX	ANNUAL	ALL	1ST		0.69459	344275	5023993	1137	1 YRS	SHRLND88.ASC	354	3	250
8 ISCST3	BLM_CBM_ClassI_88_NOX.UNOX	ANNUAL	MT_SRC	1ST		0.14758	344275	5023993	1137	1 YRS	SHRLND88.ASC	354	3	250
9 ISCST3	BLM_CBM_ClassI_88_NOX.UNOX	ANNUAL	WY_SRC	1ST		0.5694	343855	5023989	1188.72	1 YRS	SHRLND88.ASC	354	3	250
10 ISCST3	BLM_CBM_ClassI_89_NOX.UNOX	ANNUAL	ALL	1ST		0.69684	344275	5023993	1137	1 YRS	SHRLND89.ASC	354	3	250
11 ISCST3	BLM_CBM_ClassI_89_NOX.UNOX	ANNUAL	MT_SRC	1ST		0.15045	344275	5023993	1137	1 YRS	SHRLND89.ASC	354	3	250
12 ISCST3	BLM_CBM_ClassI_89_NOX.UNOX	ANNUAL	WY_SRC	1ST		0.56513	343855	5023989	1188.72	1 YRS	SHRLND89.ASC	354	3	250
13 ISCST3	BLM_CBM_ClassI_90_NOX.UNOX	ANNUAL	ALL	1ST		0.65728	343855	5023989	1188.72	1 YRS	SHRLND90.ASC	354	3	250
14 ISCST3	BLM_CBM_ClassI_90_NOX.UNOX	ANNUAL	MT_SRC	1ST		0.14612	344275	5023993	1137	1 YRS	SHRLND90.ASC	354	3	250
15 ISCST3	BLM_CBM_ClassI_90_NOX.UNOX	ANNUAL	WY_SRC	1ST		0.54571	343855	5023989	1188.72	1 YRS	SHRLND90.ASC	354	3	250